

Stanford



Samuel Rodriguez, MD

Clinical Associate Professor, Anesthesiology, Perioperative and Pain Medicine

CLINICAL OFFICES

- **Anesthesia Department**

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Bio

BIO

Dr. Sam Rodriguez is a native of New Jersey and practicing Pediatric Anesthesiologist at Stanford Children's Hospital. He is best known for being the husband of the Stanford Cardiologist Dr. Fatima Rodriguez. Sam was a member of the self proclaimed greatest Anesthesia Residency Class in history (MGH 2012). He is a founder and co-director of the Stanford CHARIOT Program which creates and studies innovative approaches to treating pediatric pain and stress through technology. The CHARIOT Program has positively impacted thousands of children around the world and has grown to include emerging technologies like virtual reality, augmented reality, and interactive video games. Dr. Rodriguez is also highly involved in medical humanities education at Stanford Medical School and teaches courses at the undergraduate and graduate levels on how studying art can make better physicians.

CLINICAL FOCUS

- Anesthesiology
- Pediatric Anesthesia

ACADEMIC APPOINTMENTS

- Clinical Associate Professor, Anesthesiology, Perioperative and Pain Medicine
- Member, Maternal & Child Health Research Institute (MCHRI)

PROFESSIONAL EDUCATION

- Fellowship: Boston Children's Hospital (2013) MA
- Residency: Massachusetts General Hospital (2012) MA
- Medical Education: Perelman School of Medicine University of Pennsylvania (2008) PA
- Board Certification: Anesthesiology, American Board of Anesthesiology (2013)
- Board Certification: Pediatric Anesthesia, American Board of Anesthesiology (2013)

LINKS

- Art and Medicine: www.samrodriguezmd.com

- chariot.stanford.edu: chariot.stanford.edu

Research & Scholarship

CLINICAL TRIALS

- Technology-Based Distractions During Minor Procedures, Recruiting
- VR Usage in Non-Invasive Surgical Sub-Specialty Procedures, Recruiting
- Evaluation of Technology-Based Stress Reduction Techniques Prior to Vascular Access, Not Recruiting
- Screen-Based Distraction Tool for Preoperative Preparation, Not Recruiting
- Transnasal Humidified Rapid-Insufflation Ventilatory Exchange (THRIVE) Use in Pediatric Procedures, Not Recruiting

Teaching

COURSES

2022-23

- The Art of Medical Diagnosis: ANES 72Q (Spr)
- The Art of Observation: Enhancing Clinical Skills Through Visual Analysis: SOMGEN 213 (Win)

2021-22

- Mending a broken heart: The Anatomy, Physiology and Psychology of congenital heart disease: ANES 74Q (Spr)
- The Art of Medical Diagnosis: ANES 72Q (Spr)
- The Art of Observation: Enhancing Clinical Skills Through Visual Analysis: SOMGEN 213 (Win)

2019-20

- Mending a broken heart: The Anatomy, Physiology and Psychology of congenital heart disease: ANES 74Q (Win)
- The Art of Observation: Enhancing Clinical Skills Through Visual Analysis: SOMGEN 213 (Win)

STANFORD ADVISEES

Med Scholar Project Advisor

Nathan Makarewicz

Publications

PUBLICATIONS

- **Small surgeries, big smiles: using virtual reality to reduce the need for sedation or general anesthesia during minor surgical procedures.** *Pediatric surgery international*
Taylor, J. S., Chandler, J. M., Menendez, M., Diyaolu, M., Austin, J. R., Gibson, M. L., Portelli, K. I., Caruso, T. J., Rodriguez, S., Chao, S. D.
2021
- **Commentary on A Body of Work: Painting a Decade of Gross Dissection.** *Academic medicine : journal of the Association of American Medical Colleges*
Rodriguez, S. n., Srivastava, S. n.
2018; 93 (3): 429
- **Bedside Entertainment and Relaxation Theater: size and novelty does matter when using video distraction for perioperative pediatric anxiety.** *Paediatric anaesthesia*
Rodriguez, S. n., Caruso, T. n., Tsui, B. n.
2017; 27 (6): 668–69
- **Interactive video game built for mask induction in pediatric patients.** *Canadian journal of anaesthesia = Journal canadien d'anesthesie*
Rodriguez, S. n., Tsui, J. H., Jiang, S. Y., Caruso, T. J.

2017

- **The transfer of care.** *Anesthesia and analgesia*
Rodriguez, S.
2015; 120 (3): 687-?
- **Percutaneous cervical sympathetic block to treat cerebral vasospasm and delayed cerebral ischemia: a review of the evidence.** *Journal of neurointerventional surgery*
Bombardieri, A. M., Albers, G. W., Rodriguez, S., Pileggi, M., Steinberg, G. K., Heit, J. J.
2022
- **What every anesthesiologist should know about virtual reality.** *Paediatric anaesthesia*
Rodriguez, S., Caruso, T. J.
2022; 32 (12): 1276-1277
- **Use of virtual reality for targeted physical rehabilitation: Case report on managing functional motor disorder.** *Journal of pediatric rehabilitation medicine*
Nguyen, A. T., Hemphill, S., Donahue, B., Menendez, M., Rodriguez, S., Caruso, T. J.
2022
- **Virtual Reality Reduces Fear and Anxiety During Pediatric Orthopaedic Cast Room Procedures: A Randomized Controlled Trial.** *Journal of pediatric orthopedics*
Richey, A. E., Hastings, K. G., Karius, A., Segovia, N. A., Caruso, T. J., Frick, S., Rodriguez, S.
2022
- **Communication Skills Training Using Remote Augmented Reality Medical Simulation: a Feasibility and Acceptability Qualitative Study.** *Medical science educator*
Hess, O., Qian, J., Bruce, J., Wang, E., Rodriguez, S., Haber, N., Caruso, T. J.
2022: 1-10
- **Quantifying virtual reality pain modulation in healthy volunteers: A randomized, crossover study.** *Journal of clinical anesthesia*
Neiman, N. R., Falkson, S. R., Rodriguez, S. T., Wang, E. Y., Hemphill, S. F., Khoury, M. E., Kist, M. N., Jackson, C. D., Caruso, T. J.
2022; 80: 110876
- **Augmented Reality as Sole Anxiolytic for Pediatric Inhalational Induction of General Anesthesia**
Sanofsky, B., Caruso, T. J., Zuniga, M., Rodriguez, S., Yun, R.
LIPPINCOTT WILLIAMS & WILKINS.2022: 81-84
- **Real-time reorientation and cognitive load adjustment allow for broad application of virtual reality in a pediatric hospital.** *Journal of clinical and translational research*
Caruso, T. J., Fonseca, A., Barreau, A., Khoury, M., Menendez, M., Wang, E., Lawrence, K., Jackson, C., Rodriguez, S.
1800; 7 (6): 750-753
- **Use of Bedside Entertainment and Relaxation Theater (BERT) to Reduce Fear and Anxiety Associated With Outpatient Procedures in Pediatric Orthopaedics.** *Journal of pediatric orthopedics*
Richey, A. E., Khoury, M., Segovia, N. A., Hastings, K. G., Caruso, T. J., Frick, S., Rodriguez, S.
2021
- **Development and assessment of an efficient pediatric affect and cooperation scale.** *Journal of clinical anesthesia*
Kennedy, K., Wang, E., Rodriguez, S. T., Qian, J., Khoury, M., Kist, M. N., Jackson, C., Yun, R., Caruso, T. J.
2021; 76: 110569
- **Development of regional anesthesia curriculum and ultrasound-guided procedural simulation models for low- and middle-income countries**
Khoo, C., Chuter, B., Rodriguez, S.
LIPPINCOTT WILLIAMS & WILKINS.2021: 720
- **Integrated eye tracking on Magic Leap One during augmented reality medical simulation: a technical report** *BMJ SIMULATION & TECHNOLOGY ENHANCED LEARNING*
Caruso, T. J., Hess, O., Roy, K., Wang, E., Rodriguez, S., Palivathukal, C., Haber, N.
2021; 7 (5): 431-434
- **Mindfulness-Based Virtual Reality Intervention for Children and Young Adults with Inflammatory Bowel Disease: A Pilot Feasibility and Acceptability Study** *CHILDREN-BASEL*

- Wren, A. A., Neiman, N., Caruso, T. J., Rodriguez, S., Taylor, K., Madill, M., Rives, H., Nguyen, L.
2021; 8 (5)
- **Unique considerations of virtual reality utilization for perioperative pediatric patients.** *Paediatric anaesthesia*
Yuan, J. C., Rodriguez, S., Caruso, T. J.
2021; 31 (3): 377–78
 - **Integrated eye tracking on Magic Leap One during augmented reality medical simulation: a technical report.** *BMJ simulation & technology enhanced learning*
Caruso, T. J., Hess, O., Roy, K., Wang, E., Rodriguez, S., Palivathukal, C., Haber, N.
2021; 7 (5): 431-434
 - **Leveraging VR/AR to combat chronic pain in youth: Position paper from the Interdisciplinary Network on Virtual and Augmented (AR/VR) Technologies for Pain (INOVATE-Pain) Management.** *Journal of medical Internet research*
Logan, D. E., Simons, L. E., Caruso, T. n., Gold, J. I., Greenleaf, W. n., Griffin, A. n., King, C. n., Menendez, M. n., Olbrecht, V. n., Rodriguez, S. n., Silvia, M. n., Stinson, J. n., Wang, et al
2021
 - **Virtual reality for pediatric periprocedural care.** *Current opinion in anaesthesiology*
Wang, E. n., Thomas, J. J., Rodriguez, S. T., Kennedy, K. M., Caruso, T. J.
2021; 34 (3): 284–91
 - **Virtual Reality Augments Movement during Physical Therapy: A Pragmatic Randomized Trial.** *American journal of physical medicine & rehabilitation*
Hemphill, S. n., Rodriguez, S. n., Wang, E. n., Koeppen, K. n., Aitken-Young, B. n., Jackson, C. n., Simons, L. n., Caruso, T. J.
2021
 - **Virtual Reality Facilitates Engagement in Physical Therapy in the Pediatric CVICU.** *Pediatric physical therapy : the official publication of the Section on Pediatrics of the American Physical Therapy Association*
Hemphill, S. n., Nguyen, A. n., Kwong, J. n., Rodriguez, S. T., Wang, E. n., Caruso, T. J.
2021; 33 (1): E7–E9
 - **Virtual Reality in Pain Rehabilitation for Youth With Chronic Pain: Pilot Feasibility Study.** *JMIR rehabilitation and assistive technologies*
Griffin, A., Wilson, L., Feinstein, A. B., Bortz, A., Heirich, M. S., Gilkerson, R., Wagner, J. F., Menendez, M., Caruso, T. J., Rodriguez, S., Naidu, S., Golianu, B., Simons, et al
2020; 7 (2): e22620
 - **A Retrospective Cohort Study of Predictors and Interventionsthat Influence Cooperation with Mask Induction in Children.** *Paediatric anaesthesia*
Marquez, J. L., Wang, E., Rodriguez, S. T., O'Connell, C., Munshey, F., Darling, C., Tsui, B., Caruso, J., Caruso, T. J.
2020
 - **Retrospective Review of the Safety and Efficacy of Virtual Reality in a Pediatric Hospital.** *Pediatric quality & safety*
Caruso, T. J., O'Connell, C., Qian, J. J., Kung, T., Wang, E., Kinnebrew, S., Pearson, M., Kist, M., Menendez, M., Rodriguez, S. T.
2020; 5 (2): e293
 - **Impact of Audio-Visual Assisted Therapeutic Ambience in Radiotherapy (AVATAR) on Anesthesia Use, Payer Charges, and Treatment Time in Pediatric Patients.** *Practical radiation oncology*
Balazy, K. E., Gutkin, P. M., Skinner, L., von Eyben, R., Fowler, T., Pinkham, D. W., Rodriguez, S., Maxim, P. G., Donaldson, S. S., Loo, B. W., Bush, K., Hiniker, S. M.
2020
 - **Mobilization and calibration of the HTC VIVE for virtual reality physical therapy.** *Digital health*
Hemphill, S., Nguyen, A., Rodriguez, S. T., Menendez, M., Wang, E., Lawrence, K., Caruso, T. J.
2020; 6: 2055207620950929
 - **Using Augmented Reality to Reduce Fear and Promote Cooperation During Pediatric Otolaryngologic Procedures.** *The Laryngoscope*
Caruso, T. J., Madill, M. n., Sidell, D. n., Meister, K. n., Wang, E. n., Menendez, M. n., Kist, M. N., Rodriguez, S. n.
2020
 - **Transnasal Humidified Rapid Insufflation Ventilatory Exchange (THRIVE) augments oxygenation in children with cyanotic heart disease during microdirect laryngoscopy and bronchoscopy** *JOURNAL OF CLINICAL ANESTHESIA*
Caruso, T. J., Sidell, D. R., Lennig, M., Menendez, M., Fonseca, A., Rodriguez, S. T., Tsui, B.

2019; 56: 53–54

- **Virtual reality use in adult ICU to mitigate anxiety for a patient on V-V ECMO** *JOURNAL OF CLINICAL ANESTHESIA*
Blair, G. J., Kapil, S., Cole, S., Rodriguez, S.
2019; 55: 26-27
- **Varying Screen Size for Passive Video Distraction During Induction of Anesthesia in Low Risk Children: A Pilot Randomized Controlled Trial.** *Paediatric anaesthesia*
Rodriguez, S., Jang, O., Hernandez, J. M., George, A. J., Caruso, T. J., Simons, L.
2019
- **Speeding the Detection of Vessel Cannulation: An In-Vitro Stimulation Study.** *Anesthesia and analgesia*
Muffly, M. K., Ku, A., Drover, D. R., Rodriguez, S., Caruso, T. J., Ku, A., Tsui, B. C.
2019
- **Virtual Reality during Pediatric Vascular Access: A Pragmatic, Prospective Randomized, Controlled Trial.** *Paediatric anaesthesia*
Caruso, T. J., George, A. n., Menendez, M. n., De Souza, E. n., Khoury, M. n., Kist, M. N., Rodriguez, S. T.
2019
- **Virtual reality use in adult ICU to mitigate anxiety for a patient on V-V ECMO.** *Journal of clinical anesthesia*
Blair, G. J., Kapil, S., Cole, S. P., Rodriguez, S.
2018; 55: 26–27
- **Saphenous nerve block for medial foot surgery: Saphenous nerve beyond cutaneous sensory distribution.** *Journal of clinical anesthesia*
Darling, C. E., Hoffinger, S. A., Rodriguez, S., Tsui, B. C.
2018; 54: 160–61
- **The Precision Portrait.** *AMA journal of ethics*
Rodriguez, S., Love, N.
2018; 20 (9): E891–893
- **Active Virtual Reality Improves Vascular Access Compliance in Anxious Children**
Yuan, J. C., Joseph, A., Rodriguez, S., Caruso, T. J.
LIPPINCOTT WILLIAMS & WILKINS.2018: 114–15
- **A Retrospective Review of a Bed-mounted Projection System for Managing Pediatric Preoperative Anxiety.** *Pediatric quality & safety*
Caruso, T. J., Tsui, J. H., Wang, E., Scheinker, D., Sharek, P. J., Cunningham, C., Rodriguez, S. T.
2018; 3 (4): e087
- **A Body of Work: Painting a Decade of Gross Dissection.** *Academic medicine : journal of the Association of American Medical Colleges*
Rodriguez, S.
2018; 93 (3): 428
- **Continuous erector spinae plane block for an open pyeloplasty in an infant.** *Journal of clinical anesthesia*
Munshay, F. n., Rodriguez, S. n., Diaz, E. n., Tsui, B. n.
2018; 47: 47–49
- **Augmented reality for intravenous access in an autistic child with difficult access.** *Paediatric anaesthesia*
Rodriguez, S. n., Munshay, F. n., Caruso, T. J.
2018; 28 (6): 569–70
- **A Novel Bed-Mounted Projection System is as Effective as Pharmacologic Modalities to Treat Pediatric Preoperative Anxiety**
Caruso, T. J., Rodriguez, S., Wang, E., Terajewicz, A., Brockington, D., Cunningham, C., Sharek, P. J., Marquez, J.
LIPPINCOTT WILLIAMS & WILKINS.2017: 23–25
- **Contralateral osteotomy of the pedicle and posterolateral elements for en bloc resection: a technique for oncological resection of posterolateral spinal tumors** *JOURNAL OF NEUROSURGERY-SPINE*
Vasudeva, V. S., Ropper, A. E., Rodriguez, S., Wu, K. C., Chi, J. H.
2017; 26 (3): 275-281
- **Initial clinical outcomes of audiovisual-assisted therapeutic ambience in radiation therapy (AVATAR).** *Practical radiation oncology*

Hiniker, S. M., Bush, K., Fowler, T., White, E. C., Rodriguez, S., Maxim, P. G., Donaldson, S. S., Loo, B. W.
2017

● **Induction.** *Anesthesia and analgesia*

Wu, M., Rodriguez, S. T.
2017

● **Provider-controlled virtual reality experience may adjust for cognitive load during vascular access in pediatric patients.** *Canadian journal of anaesthesia = Journal canadien d'anesthesie*

Yuan, J. C., Rodriguez, S. n., Caruso, T. J., Tsui, J. H.
2017

● **Epidural Steroid Injections for Radiculopathy and/or Back Pain in Children and Adolescents: A Retrospective Cohort Study With a Prospective Follow-Up.** *Regional anesthesia and pain medicine*

Kurgansky, K. E., Rodriguez, S. T., Kralj, M. S., Mooney, J. J., Dinakar, P., d'Hemecourt, P. A., Hedequist, D. J., Proctor, M. R., Berde, C. B.
2016; 41 (1): 86-92

● **Artist's statement: the mighty fellow.** *Academic medicine*

Rodriguez, S.
2015; 90 (11): 1527-?

● **The development of pediatric anesthesiology and critical care medicine at the Cincinnati Children's Hospital: an interview with Dr. Theodore Striker** *PEDIATRIC ANESTHESIA*

Ahmed, Z., Samuels, P. J., Mai, C. L., Rodriguez, S., Iftikhar, A. R., Yaster, M.
2015; 25 (8): 764-769

● **Extensive spinal epidural abscess treated with "apical laminectomies" and irrigation of the epidural space: report of 2 cases** *JOURNAL OF NEUROSURGERY-SPINE*

Abd-El-Barr, M. M., Bi, W. L., Bahluyen, B., Rodriguez, S. T., Groff, M. W., Chi, J. H.
2015; 22 (3): 318-323

● **Assessment of the length of myotomy in peroral endoscopic pyloromyotomy (G-POEM) using a submucosal tunnel technique (video).** *Surgical endoscopy*

Jung, Y., Lee, J., Gromski, M. A., Kato, M., Rodriguez, S., Chuttani, R., Matthes, K.
2014

● **A patient with surgically unrepaired single ventricle and uncontrolled amiodarone-induced thyrotoxicosis for emergent thyroidectomy.** *A & A case reports*

Downey, L., Rodriguez, S., Clendenin, D.
2014; 3 (5): 61-64

● **The development of a specialty: an interview with Dr. Mark C. Rogers, a pioneering pediatric intensivist.** *Paediatric anaesthesia*

Mai, C. L., Firth, P. G., Ahmed, Z., Rodriguez, S., Yaster, M.
2014

● **Minimally invasive spine surgery for adult degenerative lumbar scoliosis** *NEUROSURGICAL FOCUS*

Dangelmajer, S., Zadnik, P. L., Rodriguez, S. T., Gokaslan, Z. L., Sciubba, D. M.
2014; 36 (5)

● **Breaking the glass ceiling: an interview with Dr. Shirley Graves, a pioneering woman in medicine** *PEDIATRIC ANESTHESIA*

Ahmed, Z., Mai, C. L., Elder, B., Rodriguez, S., Yaster, M.
2014; 24 (4): 440-445